Analysis Model Requirements
CMWG2 Analysis Model sub-committee
Version 1.1
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1. BaBar should support 2 data content formats for physics analysis, the Mini and an upgraded form of the Micro (New Micro)
   1.1. BaBar should maintain and develop the software used to create, read, extract, import and export data samples in these formats
   1.2. BaBar should provide appropriate tools allowing easy access to the conditions data needed to interpret either of these formats from any BaBar site
   1.3. BaBar should provide all necessary documentation, tutorials, and other user support needed for both content formats
   1.4. A standard analysis job should work on either content format with only minimal configuration change, and no required change to user modules
2. The Mini requirements include the following:
   2.1. The Mini should support deep copy in a standard analysis job
   2.2. It should be possible to customize the output when making a Mini deep-copy
      2.2.1. Reconstruction objects not used by any selected BtaCandidates may optionally be removed from the output
      2.2.2. Low-level detector data (hits) may optionally be removed from the output
      2.2.3. The mini should support persistence of composite BtaCandidates
   2.3. The full mini sample (both real data and Monte-Carlo) should be accessible by physicists working from any Tier-A site
      2.3.1. Mini access should be transparent to the user in terms of building and configuring their jobs
      2.3.2. Access to particular Mini data files should be achieved within 1 hour
      2.3.3. Access to sparse mini data sets must be achieved within set time limits
         2.3.3.1. Small sample (<100 events) access will be

complete within 1 hour

2.3.3.2. Medium sample (~1K events) access will be complete within 1 day

2.3.3.3. Large sample access, typically with at least one event per file, may take up to 2 weeks to complete.

2.4. It should be possible to easily create and distribute sub-samples of Mini Data for export to individual BaBar institutions

3. The requirements on a New Micro include the following:
   3.1. The New Micro should be accessible both through CINT/Root and the standard BaBar Beta framework job
   3.2. New Micro framework jobs should support a 1Khz read rate for a typical hadronic event collection
   3.3. The New Micro will be compatible with the Mini
      3.3.1. It should be possible to write New Micro output when reading the mini
      3.3.2. It should be possible to select events using the New Micro and retrieve the Mini data for those events, with little user effort
      3.3.3. The New Micro format should support the ability to identify reconstruction objects in the Mini which correspond to particular candidates
   3.4. It should be possible to customize the content of New Micro output
      3.4.1. Standard detector information (compatible with the existing XxxQuals) can be optionally stored and read
      3.4.2. Additional user information may be optionally stored and read
      3.4.3. Composite candidates information may be optionally stored and read, with either pointers to the decay tree or 4vector and vertex information.
      3.4.4. The output of standard PID selectors may be saved with candidates
      3.4.5. The user may specify which track fit hypotheses are stored
   3.5. It should be possible to easily create and distribute subsamples of New Micro for export to individual BaBar institutions
4. BaBar should continue to support a data format equivalent to the

current Tag, which will be used to select events for subsequent analysis

4.1. It should be possible to select events based on Tag information when reading either Mini or the New Micro collections

4.2. The Tag content should be optimized to remove unused and redundant content

4.2.1. Event-wide floats of general utility (R2, primary Vertex, etc) should be kept

4.2.2. The Boolean data (TagBits) should be rationalized, with obsolete and redundant bits removed

4.2.3. Candidate-specific floats should be removed, in favor of reading that information from the New Micro or Mini

5. Babar should support centrally-produced physics skims customized by the relevant AWGs

5.1. Both Mini or New Micro format skims should be supported, with the computing and physics management responsible for determining which skims are in which formats.

5.2. Either pointer or deep copy collections should be supported, again dependent on the size of the output and the needs of the AWG.

5.3. Skims should be readily accessible by physicists working at any Tier A site

5.4. Skims should be made for both BaBar data and generic Monte-Carlo.

5.5. Skims should be remade regularly to follow algorithm changes and bug fixes

6. A version of the New Micro for the full BaBar data sample (AllEvents and Monte-Carlo samples) should be readily accessible by physicists working at any Tier-A site